

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/09828

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B23Q 3/00; B21D 39/00; B23P 19/04; B25B 27/14
US CL : 29/464, 520, 237, 272

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 29/464, 520, 237, 272, 516, 517, 508; 33/412, 661

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, 6,430,792 B1 (FOSTER et al.) 13 August 2002 (13.08.2002). See entire document.	1-6, 9, 10
A	US 3,726,122 A (DAWSON) 10 April 1973 (10.04.1973). See entire document.	1-6, 9, 10
A	US 4,189,817 A (MOEBIUS) 26 February 1980 (26.02.1980). See entire document.	1-6, 9, 10
A	US 5,347,701 A (HOSSEINIAN et al.) 20 September 1994 (20.09.1994). See entire document.	1-6, 9, 10
X	US 2,656,607 A (HARDING) 27 October 1953 (27.10.1953). In Figures 1 and 4, note first curved end portion 50, second curved end portion 52, and cross piece 30/48 for connecting the first and second portions.	7, 8
X	US 2,514,374 A (COOPER) 11 July 1950 (11.07.1950). In Figures 1 and 2, note first curved end portion 18, second curved end portion 19, and cross piece 41 for connecting the first and second portions.	7, 8

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

30 September 2004 (30.09.2004)

Date of mailing of the international search report

22 NOV 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

David P. Bryant

Telephone No. (703) 308-1148

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/09828

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 409,008 A (BREYMAN) 13 August 1889 (13.08.1889). In Figures 1 and 2, note first curved end portion D, second curved end portion C, and cross piece E for connecting the first and second portions.	7, 8
A	US 2,105,954 A (RIPPE) 18 January 1938 (18.01.1938). See the Figures.	7, 8